

Tribal Watersheds Workshop – Analyzing Data and Assessing Impairment

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Session Agenda

➤ Analyzing Data

- Visuals
- Trends in time / space

➤ Determining Impairment

- Waterbody uses
- Protective criteria – numeric, narrative, AD
- Comparisons to criteria







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- Trends in time / space

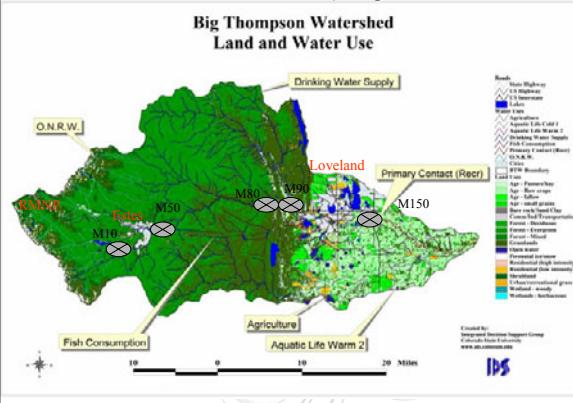
➤ Determining Impairment

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Data Sheet

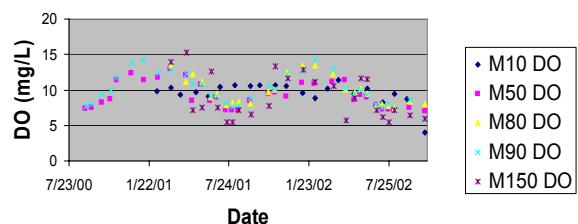
DATA SHEET		Wednesday, October 16, 2002				
Site #	Location	Temperature	Dissolved Oxygen	pH	Turbidity	
		(Celsius)	(mg/L) %		(JTU)	
M10	Moraine Park ROMO	4	4 42	8.5	0	
M50	Below Lake Estes & UTSD	7	7 76	8.5	15	
M80	Above Sylvan Dale	10	8 87	8	0	
M90	LV Drinking Water intake	10	6 64	9	0	
M150	I25 below Loveland	10	6 63	8	0	

Watershed – Sampling Sites



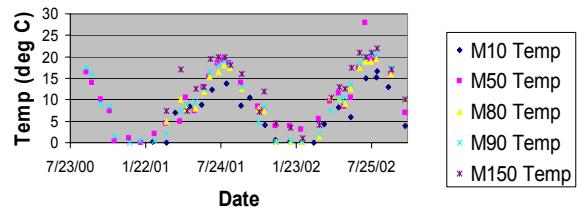
Temporal Variability

Big Thompson Dissolved Oxygen



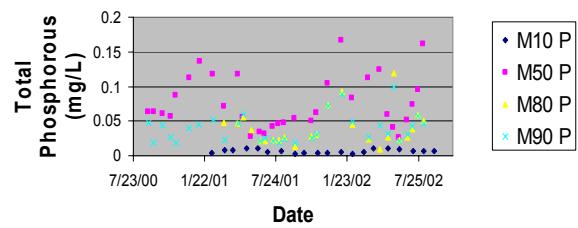
Temporal Variability

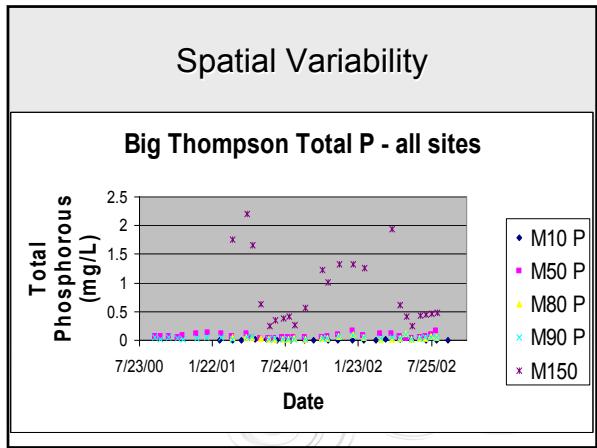
Big Thompson Water Temperature



Spatial Variability

Big Thompson Total P - upper sites



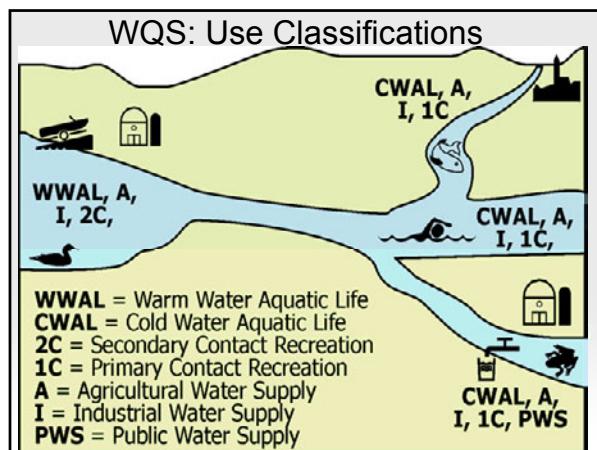


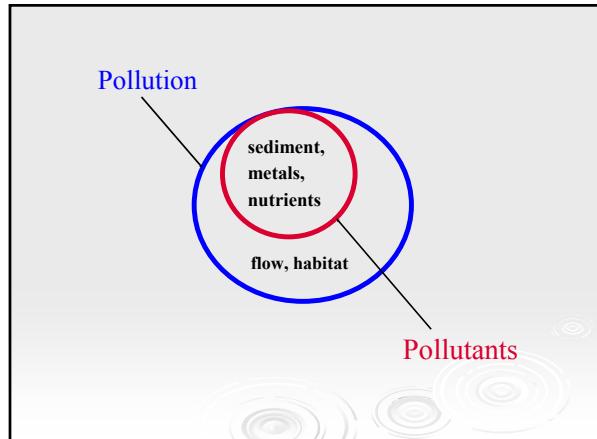
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Reminder: A Water Quality Standard consists of four basic elements:

- 1) **Designated Uses** of the waterbody (e.g. recreation, water supply, aquatic life, agriculture, cultural)
- 2) **Water Quality Criteria** to protect designated uses (numeric pollutant concentration and narrative requirements)
- 3) **Antidegradation Policy** to maintain and protect existing uses and high quality waters
- 4) **General Policies** for implementation (e.g. low flows, variances, mixing zones)







Water Quality Standards					
	(sampler)				
Parameter	Aquatic Life (acute)	Aquatic Life (chronic)	Agric. & Livestock	Drinking Water	Human Health (fish)
Cadmium (ug/l)	3.9 (1 hour)	1.1 (4 day)	10 (30 day)	10 (1 day)	--
Mercury (ug/l)	2.4 (1 hour)	0.012 (4 day)	--	2.0 (1 day)	0.3 mg/kg
Selenium (ug/l)	20 (1 hour)	5 (4 day)	20 (30 day)	170 (30 day)	9000

Magnitude Frequency Duration



Compare data to Criteria		
Table 1. Water Quality Standards for pH, temperature, and turbidity.		
Parameter	Classification	Standard
pH	All	6.5 – 9
Temperature	Salmonid	Max 20 °C (narrative standards also apply) ¹
	Non-salmonid	Max 25 °C (narrative standards also apply) ¹
Turbidity	All	Narrative (EPA ecoregional values may be used; or an unimpaired upstream site can be used for comparison).
Conductivity	Irrigation	1,500 umhos/cm – exceedence may affect agricultural uses

Table 2. Dissolved oxygen criteria		
Time Period	Fisheries and Associated Aquatic Life	
	Salmonid	Non-Salmonid
30-day average	NA*	N/A
7-day average	9.5 (6.5)	6
7-day average minimum	NA	NA
1-day minimum	8.0 (5.0)	5